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ABSTRACT

This study analyzed aspects of a knowledge base for teaching and ways that teachers understood and described the required student knowledge base, highlighting the construction of a knowledge base for elementary teaching. Participants were elementary teachers and staff from one Brazilian elementary school. Teachers wrote reports on what they believed was the knowledge base that students must possess at the end of the school year in order to perform efficiently in the next grade. Teachers also collaborated to prepare written reports about a shared knowledge base for each grade. Using data from interviews, observations, individual reports, group reports, official documents, and teachers' reflective diaries, researchers examined: knowledge and interpretation of national curriculum guidelines; construction of the school knowledge base; personal and professional stories; and shared professional lives. Teachers' responses were very diverse. The most frequently mentioned knowledge generally did not discriminate between the grades. Teachers attributed the most importance to content and ability related to mathematics and Portuguese. The specific content knowledge of different subjects appeared to be the nucleus of the specification of the knowledge base. Teachers considered the construction of pedagogical content knowledge the most important element necessary for learning to teach. (Contains 40 references.) (SM)

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TEACHERS CONSTRUCT A KNOWLEDGE BASE FOR A BRAZILIAN ELEMENTARY SCHOOL: ANALYZING A TEACHING-LEARNING EXPERIENCE DEVELOPED THROUGH UNIVERSITY - PUBLIC SCHOOL PARTNERSHIP [1, 2]

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Introduction

The current work refers to the subproject of a broader project of applied research developed in partnership between researchers from the Universidade Federal de São Carlos and professionals from the initial grades of an elementary school of a medium-sized town of the state of São Paulo, Brazil. The project has as its axis the investigation of the professional learning and development processes of teachers.

The goals of the broader project are twofold: to build a knowledge base of learning and professional development processes of teachers; and to define when, where and by what means the participants will intervene in these processes with the goal of refining this knowledge. The basic research question guiding the study is: *How can a constructive-collaborative intervention, that draws on a reflection of the teachers' practice in their workplace be considered and used as a successful strategy for improving pedagogical actions in ways to overcome school, teacher, and student failures?*

A constructive-collaborative approach (Cole & Knowles, 1993) has been adopted, which presumes that an improvement in teaching quality to overcome school and student failure implies the natural and voluntary participation of teachers in the discussion of alternative propositions aims to accomplish such goals. Such an approach implies, amongst other assumptions:

a) the concept of teachers' professional development considered as part of a continuum that seeks to establish connections between initial and continuing teacher education;

b) the valuing of the teachers' professional development processes, of contextual and organizational aspects, orientated towards change, and combining the individual and collective dimensions of the pedagogical activity;

c) the construction of teaching knowledge as a result of the dialectical relation between the individual and the collective;

d) the inquiry-reflection principle (Knowles, Cole, & Presswood, 1994), which, amongst others: facilitates the teachers' understandings about their pedagogical practices; considers the collaborative nature of the roles impersonated by their peers; acknowledges the specificity of the pedagogical practice as requiring non-standardized solutions; admits the influence of teachers' conceptions in the understanding of classroom events and in their teaching practice; enables the development of personal and professional autonomy;

e) ... new forms of partnership research [...] based on fundamental assumptions about the importance of mutuality in purpose, interpretation, and reporting and about the potency of multiple perspectives. Also implicit in this model is the understanding that each partner in the inquiry process contributes particular and important expertise, and that the relationship between classroom teacher and the university researcher, for example, is multifaceted and ***not*** *powerfully hierarchical* (Cole & Knowles, 1993:478);

f) the need to establish a base knowledge that makes professional development possible;

[1] Research/intervention project "The reflection on the pedagogical practice as a strategy of modification for the elementary public school as a perspective of continuing teacher education based in the work place", conducted by a group of researchers from UFSCar (Federal University of São Carlos), sponsored by FAPESP (Support Program to researchers related to public education in the state of São Paulo – ENSINO PUBLICO),1996-2000.

[2] Paper presented at the AERA Annual Meeting, New Orleans – LA, 2000.

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g) the consideration of processes of pedagogical knowledge content construction in different subject matters;

h) the notion of school as an organization that learns;

i) the construction of teachers' professional empowerment processes;

j) the consideration of translations and transpositions of educational public policies related to schools and classrooms.

The present study aims specifically to analyze the aspects of the knowledge base for teaching in the basic school as well as the ways the schoolteachers understand, describe and explain the required student knowledge base. It first considers how conceptions – which reflect the individual and collective knowledge base of the research participants – structure themselves in the formalization of a knowledge base for the school itself. Secondly, it analyzes the possible translations that the school teachers' – individually and collectively - make regarding the required base knowledge in order to bring the National Curricular Guidelines (BRASIL, MEC, 1997) to the school and to the classrooms.

1. Theoretical Orientation

In the present project we have adopted, as theoretical orientation to the understanding of base knowledge construction processes for the elementary school teaching, literature related to teacher thinking, to 'reflection as conceptual orientation' (Valli, 1992) and to knowledge base specifically (Shulman, 1986, 1987; Schoenfeld, 1997).

To learn to teach is a complex process that involves, amongst others, affective, cognitive, ethical, and performance related factors (Cole & Knowles, 1993). According to Calderhead (1993) coherent and comprehensive theoretical guidelines and a general theory of knowledge about professional learning that can enlighten the processes of professional development of teachers in ways to inform the construction of pre-service and in-service teacher education programs are yet to be formulated.

Studies on teachers' thinking, on reflective teaching, on knowledge base for teaching, on tacit/practical theories etc., although based on different theoretical and methodological orientation, have been pointing to the constructive dimension of the professional knowledge; to the fact that this knowledge is developed during teaching; and to the personal dimension added to this constructive process.

Studies have also indicated that teachers' knowledge, beliefs, and goals are fundamental elements in the determination of how they act in the classroom and why they act that way; learning to teach is a developmental process and requires time and resources so that teachers' modify their practice; that the modifications teachers need to accomplish in order to contemplate new social and political demands go beyond the learning of new techniques, implying conceptual revisions of the educational and instructional process and of the practice itself.

It is also known that: the needs of students are the focus of today's educational public policies; the structure and content of professional development programs must be determined by the teachers themselves; the educational programs need to be adapted to specific schools; adult learning processes are more related to practice than theory and that a support and professional growth environment is of extreme importance (Torres, 1998, 1999; Wittrock, 1986; Clark e Peterson, 1986; Darling-Hammond, 1994; Marcelo, 1998; Calderhead, 1996; Schoenfeld, 1997).

Current literature presents, amongst others, descriptive models of teaching processes; models of knowledge base for teaching and of pedagogical reasoning; descriptions of beliefs and types of knowledge of teachers; analytical models of narratives and stories constructed by teachers. The same literature, on the other hand, is reluctant to consider how multiple variables may shape and co-determine how the teachers act and why they act the way they do in the development of the instructional process (Schoenfeld, 1997).

Many researchers have offered important contributions to the development of a new epistemology of practice (even though that terminology is the focus of some discussion), which consider specific needs of teachers' professional development: Schön (1983, 1987, 1988), Elbaz (1983), Nóvoa (1992), Calderhead (1993), Knowles, Cole & Presswood (1994), Clandinin &

Connelly (1996), Shulman (1987, 1988, 1996), Zeichner (1993), Doyle (1990), and Huberman (1993), amongst others.

Despite all the different theoretical and methodological orientations under which the theme is studied, *reflective teaching* expresses the preoccupation with personal experiences and practice in the professional development of teachers. The basic assumption of *reflective teaching* is that teachers' beliefs, values, and hypotheses on teaching, subject matter, curricular content, students, learning, etc., enhance their practice. When the teachers describe, analyze, and make inferences about classroom events, they are creating their own pedagogical principles. The reflection would offer them the opportunity to gradually make their practical/implicit theory objective.

It is important to consider that *reflection* is not taken here as a synonym for *wise judgment*. It is well known that experience can lead to wrong learning and to the crystallization of inadequate and discriminatory practices.

It is agreed that in this work *reflection* is *conceptual orientation*, thus avoiding conflicting ideas for teaching. According to Valli (1992), despite their differences, researchers adopt the basic assumption that reflection is a conceptual orientation: admitting different variations (emphasis in specific content and emphasis in personal experiences, amongst others). Only a reflective paradigm, says Valli, has the power to integrate distinct components of teaching: reflective teachers base themselves on personal knowledge, professional knowledge, propositional knowledge, and technical knowledge. Another benefit of considering reflection as a conceptual orientation relates to the fact that reflection is not a natural disposition. Without an explicit commitment to reflection, reflection will probably be sporadic and superficial. Valli states that there are at least six different levels of knowledge that orient the practice, grouped into two approaches to teaching: *technical rationality* (level 1 – behavioral, and level 2 – technical decision making) and *practical reflective* (level 3 – reflection-in-action, level 4 – deliberative, level 5 – personalistic, and level 6 – critical).

These six levels may be seen as hierarchical qualities of good teachers and are compatible with the teachers' use of different types of knowledge in their practice. The world of practice, in this way, understands both technical rationality and reflective practice.

By proposing this taxonomy, Valli (1992) considers the conceptions of educational excellence. The three last conceptions (deliberative, personalistic, and critical levels) are, potentially; more inclusive in what refers to educational values and social responsibility. The order suggests that certain levels must be considered as pre-requisites to others, and that certain themes or educational questions have a different emphasis. A reflective orientation for teacher education should clearly contemplate the content, processes, and attitudes valued in the reflective practice

Schulman (1986, 1987) proposes two models for the investigation of the role of knowledge in teaching, for the foundations of knowledge base for teaching, for pedagogical processes of reflection and action involved in teaching: the *personal knowledge base* and the *process of pedagogical reasoning*. Both theoretical orientations consider different types of knowledge for teaching and the processes by which this knowledge is constructed and utilized.

By knowledge base we mean the body of understandings, knowledge, abilities and dispositions necessary for the effective teaching in specific situations (Wilson, Schulman, & Richert, 1987). Among the foundations of this knowledge base we have different kinds of knowledge that support the decision making process of teachers (Schulman, 1986, 1987):

- *specific content knowledge* (basic concepts of an area of knowledge which implies comprehension about ways of thinking and understanding the construction of knowledge in one specific area and its structure);
- *general pedagogical knowledge:* (knowledge that transcends the realms of one specific area and includes the knowledge of educational goals; of teaching and learning; of classroom management; of teacher-student interaction; of instructional strategies; of how the student learns; of other contents; of curricular contents);
- *pedagogical content knowledge*: by exercising their profession, teachers develop a new kind of knowledge of their specific area which is improved and enriched by other types of knowledge (student's, curricular, other areas, and pedagogical). This is the *pedagogical content knowledge*, which can be considered a new type of knowledge, for it embodies the more

relevant aspects of the contents to be studied, by means of more pertinent concept representations, of powerful analogies, illustrations, examples, explanations, and demonstrations (Schulman, 1986). It also includes the understanding of what makes it harder or easier to learn specific issues or topics, and the conceptions and pre-conception of students of different ages and backgrounds.

According to Schoenfeld (1997), what a teacher can perform in one specific situation is fundamentally shaped by a group of intellectual resources that he or she brings to the teaching situation. This is called the *knowledge base*. The plans of action – in diverse levels – occupy a central position and can be used to activate the goals. This is a broad category that includes a variety of knowledge both general and classroom related, including the knowledge of interactive routines, considered by literature as being basic to teacher education processes: Shulman (1986, 1987), Calderhead (1996), Clark and Peterson (1986), Fenstermacher (1994), Darling-Hammond (1994).

Taking the contents of knowledge into consideration, literature has pointed to a broad variety of categories: personal practical knowledge (Elbaz, 1983; Connely & Clandinin, 1988), knowledge-in-action (Schön, 1983, 1987), professional knowledge (Calderhead, 1996; Tardif et al., 1991; Huberman, 1993) case knowledge (J.H Shulman, 1992; Shulman, 1992, 1996); educational foundation knowledge (Grimmet & Erickson, 1988), metaphors (Clandinin, 1986), and many others equally important to the process of the professional development of teachers.

Schoenfeld (1997) adopts the same distinction made by Shulman. According to Schoenfeld, beyond the inventory of knowledge, a second basic point that permeates all the aforementioned categories refers to how the knowledge is accessed and used. This point is crucial to the elaboration of a teaching-in-context theory.

Schoenfeld (pg. 25) considers that it is accepted by Psychology that

> *...people organize their experiences mentally via mental representations of familiar 'classes' of experience. The most common name for such abstraction is 'schema' (plural schemata); related terms are scripts and frames. Attached to a schema are its typical features, some knowledge related to it, and typical ways of behaving when that schema has been called to mind.*

The main idea behind the schema is that the human being abstracts its world experiences and uses such abstractions as a means to perceive and interpret elements when interacting with them. Bearing in mind that one of the dimensions of the memory is that it groups its repertoire in chunks, and that another is its associative property, when a particular item comes to mind other related items also will come. To bring a particular item to mind, is to bring not only the knowledge related to it that the individual may possess, but also to bring beliefs and emotions along with it. An event that triggers particular beliefs can also trigger knowledge related to such beliefs. The notion of schemas is also present in Gimeno Sacristán (1991), who offers descriptions and understandings related to the professional learning of teaching.

The process of pedagogical reasoning (Shulman, 1987; Wilson, Shulman & Richert, 1987) consists in a process of reasoning and action involving six aspects common to the act of teaching: comprehension, transformation (interpretation, representation, adaptation, and consideration of specific cases), instruction, evaluation, reflection, and new comprehension. By means of such process, the professional knowledge is constructed.

In the realization of the learning and teaching experience considered here, we also adopt as theoretical reference the analyses of Giroux (1997) regarding the courses' objectives: *micro* and *macro* objectives. The *micro* objectives are usually limited by the specificity of the intentions related to the singularity of a given course. They are those imposed conceptions that constitute the nucleus of a given subject matter and define its course of investigation).The *macro* objectives offer, according to Giroux a classification system which help teachers and students to go beyond the contents of a given subject matter. They also offer students the necessary theoretical foundations that makes it possible for them to establish connections among methods, contents, course and a broader social reality. We can emphasize, in this context, the importance of the relationship between micro and macro objectives. In this sense, according to Sacristan Gimeno (1995) what the students learn in the school situation – and what they also seize to learn – is broader than the conception of curriculum as a specification of all kinds of themes and contents.

That is, the real curriculum is broader than any kind of 'document' in which are reflected objectives and plans.

2. Methodological orientations

2.1. The research question and issues under investigation

Considering the nature of the broader project and the theoretical and methodological orientation on which it is supported – which itself implies process decision taking -, during the project's first year of development strategies for research and intervention were constructed which the group named 'teaching and learning experiences'. They have been used throughout the years of this project's existence, and can be defined as:

> [...] *structured situations of teaching and learning, planned by the researchers and schoolteachers, implemented by the schoolteachers, collectively discussed, originating from issues chosen by them individually or by the group. These are experiences with a beginning, middle, and an end—and may be developed by small groups or by each teacher with his or her students. These experiences are born from practical difficulties related to different subject matters; challenges, which may rise from, school daily activities; and public policies* (Mizukami et al., 1998, p. 3).

The present study is specifically about one of those teaching and learning experiences which we have called *Constructing a knowledge base for the initial grades of elementary teaching: What should my student know by the end of the school year?* Its primary goals are:

a) to obtain answers to the following research questions:

What contents and abilities – raised by the schoolteachers individually or as a group – must be mastered by the students at the end of each of the four grades? What differences can be made clear regarding the indicated contents and abilities having in mind the four grades in consideration? What differences can be made clear through the collective answers of the schoolteachers when compared to their individual answers when the theme in discussion regards to the knowledge (specific content and abilities) that was dealt with?

b) To promote individual and collective teachers' learning processes in order to have an impact on the construction of a curriculum to be gradually absorbed by the school as a group.

c) To find and explore organizational spaces, taking into consideration the school culture, in order to consider – individually and collectively - teachers' beliefs and personal theories on curriculum and school knowledge.

d) To guarantee processes of negotiation among the school teachers and other school members in order to define a specific curriculum that will be construct and assessed by them.

From this perspective we stress that in the current Brazilian educational climate, new educational policies have been introduced emphasizing radical changes in relation to the school's social function, teaching, learning, empowerment, student inclusion and equity/social justice, to name a few, as well as the conceptions related to the teachers' role in face of new and alternative teaching models. Such policies – especially those related to the National Curriculum Guidelines for different levels of schooling – have been 'presented' or 'merely transmitted' to the schoolteachers

in episodic way, not considering context. The language is hermetic[3], with conceptual density not usually present in teacher education programs. From the point of view of those who write public polices the application of such policies might seem like an easy task, but reality proves these that to be wrong. Hence the objective of the present teaching and learning experience: to promote a discussion – considering different interpretations - of which of the educational public policies can, in fact, be effectively used in everyday school reality.

The present study considers that what is taught in classrooms transcends each and every intention or description about what would be desired or even about what has been effectively happening both in school and classroom. Considering the manifestations of the participants regarding the reported goal experienced, we must stress that only a part of the whole teaching and learning universe lived by the students and conducted by the teachers is represented here. Bearing this in mind the data obtained have been analyzed in relation to the third and fourth levels of curricular effectuation (National Curricular Guidelines for the Fundamental Teaching – Introductory Document, 1997), that is, the elaboration of a curricular proposal for the school and the elaboration of activities of teaching and learning in classrooms.

2.2. Participants

Involved in the realization of this teaching and learning experience were 27 professionals from the Escola Luiz Augusto de Oliveira elementary school (first four grades) – the Principal, 24 teachers, the Library Assistant and the Pedagogical Coordinator; 6 researchers from the university (Universidade Federal de São Carlos) and 3 specialists from different subject matters. The period of the research was October to December 1999.

All participants were women and, of the 24 schoolteachers 6 taught first grade, 5-second grade, 6 third grade and 7 fourth grade.

2.3. Design and methodology

During the development of the broader project many 'learning and teaching experiences' were conducted which showed the necessity to construct an individual and a collective knowledge base for the schoolteachers. The project began in 1996 with the verbalization of concepts related to the understandings of schoolteachers about school, teaching, learning, students, subject matters, assessment, school/teacher/student success and/or failure, instructional strategies, classroom management, approval or retention criteria etc.

From these initial explanations some learning and teaching experiences were realized aiming, on the one hand, to better identify and understand the professional learning and development processes of the schoolteachers and, on the other hand, to promote them. We therefore stress the dimensions/nature and, at the same time, investigation and intervention, of such strategies. In order to exemplify, some of them are here mentioned: *Knowing the school students; Learning Sciences; Learning Mathematics; Learning Portuguese; Constructing the knowledge base: what my students must know?; School-families Interactions: Let's help our children; Let's assess our students: constructing a common assessment tool for each grade; School library and the searching for references; Specifying pedagogical discourse versus contrasting personal theories; Hearing and telling stories: children literature in perspective; The school library and the creation of new spaces of knowledge; Telling stories in the schoolyard', Understanding the first grades National Curricular Guidelines for the Fundamental School.*

The starting point for the teaching and learning experience considered here consisted of gathering individual written reports from the schoolteachers, who were invited to answer a basic proposed question: *What is the knowledge base that my student must possess at the end of the school year in order to perform efficiently the next grade?* This question involved the consideration of five subject matters from the official school curriculum in relation to the basic first four grades: Portuguese, Mathematics, Sciences, History and Geography.

After the initial reports were written, during the period from the second half of October to the end of November the schoolteachers worked in groups and the composition criteria was the grade

[3] See, for example, "Parâmetros Curriculares Nacionais para o Ensino Fundamental – Documento Introdutório", MEC, 1997.

each teacher taught. The groups held one two-hour meeting each week and had the task of preparing a written report about a shared knowledge base for the respective grade.

During December the meetings were centered on the collective discussion of the groups reports in order to provide access - to all the schoolteachers - to the specified knowledge base and to discuss peer production. These meetings enabled global comprehension of each of the grades and of the relations among the grades themselves.

From January 1999 until now the following phases of this experience conducted in order to construct the school pedagogical project were:

a) *Knowing and interpreting the National Curriculum Guidelines* (from January to June). Study of the Introductory Document that specifies the foundations of the new public policy for the fundamental teaching and of the general organization and the concepts related to each of the subject matters, their interrelations and the transversal themes considered in such a level of teaching.
b) *Constructing the school knowledge base: contrasting personal, collective and official discourse*. Confrontation between the conceptions verbalized in two learning and teaching experiences (*What my students must know...* and *Knowing and interpreting...)* in order to construct a shared knowledge base for the school.
c) *Personal and professional stories: searching for individual and collective meanings*. Verbalization of the schoolteachers personal and professional stories, and the stories of this specific professional group considering the school and public policies for education.
d) *Sharing professional lives'*. Confrontation amongst personal trajectories in order to understand the related professional learning and development processes.

The last three learning and teaching experiences were developed taking into consideration results offered by other people's realized experiences.

The data sources for the mentioned experiences are: interviews, observation, participatory observation, individual written reports, group written reports, official documents (e.g. the school's public policies), documents (such as instructional material, teachers' plans, students production etc.), teachers' reflective diaries, and others. The specificity of each ,one of the learning and teaching experiences were considered.

The experience reported here, "*What my students must know...*" is a descriptive and analytical study. The sources of data were an observation journal of all the meetings (for each one of the grades and the collective ones); individual written reports and written reports made by groups related to each of the four grades. The data are predominantly of qualitative nature. They were initially described to paint individual and collective 'portraits' – taking into account each grade and each subject matter – after which they were analyzed and the theoretical orientations adopted were considered.

3. Preliminary Results

3.1. Describing some results

To 80% of the first grade schoolteachers, *to read, to interpret and to understand small texts* constitutes the central point of the teaching in that grade. *To write words, sentences and a variety of texts, to segment correctly (or with only a few errors) the words; to participate of different situations of oral communication, taking into account, respecting and considering other people opinions and social differences,* and *to report facts, maintaining chronological order and the type of relations; manifestations of experiences, feelings, ideas and opinions* consist of, apparently other main objectives to be attained considering the written reports related to Portuguese.

Some of the objectives mentioned are of a very complex nature and possibly more appropriate for the more advanced grades. For example: *To master with precision syllables formed by consonants and vowels (simple syllables), to master the remaining syllables with a few failures*

[mostly related to the spelling of the words] seem to constitute objectives difficult to attain at the end of the first grade.

In Mathematics the contents and abilities indicated by the first grade schoolteachers seldom matched. *"To write and to indicate natural numbers from 0 to 100', "to offer the preceding and succeeding numbers of a given natural number', 'to perceive the necessity and usage of symbols; that the symbol transmits an idea'* were contents and abilities indicated by more than 65% of the schoolteachers.

A general analysis of the teachers' answers shows a diversity of content. A considerable variety in the list of abilities indicates that making the definition of what, in fact, they consider important, and that determining the level of complexity in a given content to be mastered are difficult. For instance, the contents and abilities related to mastering the four basic mathematical operations were presented by different forms and with varied meanings, suggesting the contents may differ from group to group in the same grade.

In the sciences subject matter the schoolteachers presented a list of contents that can be grouped in two blocks: one related to the functional organization of the environment, the other to the interactions between man and ambient. These contents, nevertheless, were not equally considered by all the teachers, which made difficult to identify what sciences are desirable to learn considering the involved abilities and their respective levels of complexity.

When indicating contents and abilities related to History, three of the schoolteachers presented them along with Geography. Generally speaking, we can observe that in the first grade the teachers emphasize issues of space-time nature having as an axis the life of each one of the students and also aspects more directly related to their personal and family lives. The same emphasis is observed in Geography. The schoolteachers individually refer to the knowledge of the neighborhood in which the home of the student is localized.

Considering the elaboration of only one proposal for the grade, the teachers contemplated, as cut criteria, the 'minimum' standards of attainment specified by them. The schoolteachers seem to attribute importance to the realization of the activities related to this teaching and learning experience in order to change aspects of their teaching. They show expectations related to the quality of student learning. They consider it important having the opportunity of knowing what each of the grades establishes for its students. The school dynamic, until that moment, did not offer space for exchange between peers and for the construction of a common project that listens to their opinions.

> *"The most difficult thing is the "I" and "ours"... I dropped Coordination because there are people there who refuse to change... If the students are to change ... [the teachers] must change... If not, we are only moving the student forward one grade to the next... "(T.25).*

For the second grade teachers, *"to read and to interpret – orally and by written reports – diverse literary texts; children's literature, poems, music, short stories, tales, fables, comics, advertisement, news, magazines etc"* seem to be fundamental abilities related to Portuguese (these were indicated by all of them.) Secondly these teachers indicate that their students, at the end of the school year, must *"recognize and utilize conveniently the punctuation signs, paragraphs, expressing their ideas clearly in sentences, production of texts, opinions, etc."; "show coherence and cohesiveness in a reasonable way; organization of paragraphs"*. They don't mention, however, at what level of complexity such contents and abilities must be mastered.

Some of the teachers' answers refer to the means by which they could develop the indicated abilities and teach the contents stressed as, for instance: *"the contents studied must relate themselves to those of other subject matters" or "the language* [can be dealt] *in diversified ways through reading, talking hour, stories hour, dramatizations, collective discussions of current issues (personal opinion of each student)"*. We can consider such preoccupations as pertinent and relevant: considering the students find themselves in the phase of mastering literacy.

For Mathematics, the contents and abilities most frequently stressed by teachers are: *'understanding the fundamental facts surrounding the four basic operations; learning the four operations in the correct way; mastering the four basic operations; to effectuate mathematical calculation involving addition, subtraction, multiplication and division using conventional signs, personal strategies and conventional techniques"*. Secondly, they pointed out: *"To dexterously read*

and write the decimal numerical system; to understand the decimal numerical system': "to identify and solve the faced problem situation; to interpret and to solve problem situation attributing meaning to the arithmetical operations"; "to perceive differences and similarities between diverse geometrical forms; having Geometry notions." Other contents and abilities were also pointed out, but in an inconsistent way when we consider all the six schoolteachers.

It is important to consider that only in a few cases the teachers' indications are precise, such as *"to read, write and to know how to count up to 1000' and 'to order, to compare and to know how to count in ascending and descending scales from one to another given number (one in one, two in two, three in three.... ten in ten)".* Most of the time that doesn't happen. For instance: *"to dexterously read and write the decimal numerical system; to understand the decimal numerical system' and 'to have fractionally numbers notions'* do not present enough elements about what or in which complexity level the students must master the involved contents and abilities.

With regard to the Sciences, almost all the schoolteachers mentioned two broad objectives possibly related to a large set of contents involving the development of complex abilities. We suspect that these objectives are related much more to their general aspirations than to what they effectively do in their classrooms. It is possible that the day-to-day developed activities may be simpler and could in this way be represented by more compatible objectives.

Part of the answers related to the subject Geography refers to contents and abilities involved in *"to actually knowing the place where the student lives".* Other answers are isolated manifestations that reflect notions that are much more individual than collective.

When teaching History the second grade schoolteachers apparently focus their teaching on the development of notions related to the more immediate lives of their students. Such is the case of: *"to identify the different social groups'* (66,7%). The answers, in some cases, amplify notions to be ideally studied such as, for instance: *"to recognize the presence of some elements from the past, from the present, projecting its reality to one historic dimension, identifying the participation of different people, works and events of other times in the dynamic of the actual life"* Many of the answers obtained for History are the same, or almost the same, as those obtained in Geography.

The answers we have gathered from second grade teachers (when discussing their individual opinions with those of their peers) match the answers we obtained from the first grade teachers. It is also interesting to note that their content choices present a striking diversity. Private conceptions related to the meaning of some of the contents and abilities considered can also be found. It seems that the teachers frequently have a type of knowledge which explanation, when written, may be difficult to accomplish. Some of the possible criteria adopted by them are described in an imprecise way. Another possible explanation for this situation implies the consideration of a codified pattern of communication amongst the schoolteachers, which would make it unnecessary to objectify detailed answers.

These two focuses can be illustrated in the following dialogue between the teachers and one researcher:

> *"T: ... to teach using different types of text... to interpret texts ... [the] language for the second grade... [must be] less complicated than the one of the third grade [whose] texts [are] longer, [the] vocabulary is more....*
>
> *R: ... interpretation... is it only about the text or is it [about] what goes beyond the text?*
>
> *T: It is only about what is in the text.*
>
> *R: But it may be good to write it in order to present it to the third grade teacher...*
>
> *T: The third grade teacher already knows...*
>
> *R: What do you think it is reasonable to you?*
>
> *T4: A perfect text ... would be one that is written in such a way that it expresses its contents in a clear way, with good orthography ... so that whoever picks it up understands it well enough*
>
> *R: (...) what does the third grade teacher understands as being reasonable orthography?*
>
> *T10: I think that we cannot require perfect orthography from children or else the children may acquire distaste for writing.*
>
> *R: What are the admissible failures? What errors to accept?*
>
> *T14: We search in the dictionary the words sound the same.*

T10: The most important thing is for children to enjoy writing, expressing their ideas... We cannot require perfect orthography... If the student ask me how to write a certain word, I'll tell him... he will know the correct form...

T4: Write [in the written report] understandable orthography..."

On deciding what to include in the final version of the written group activity, the second grade teachers chose to add a set of contents and abilities – related to social interaction in the classrooms which they labeled 'general'.

Considering the answers of the third grade schoolteachers related to Portuguese we can observe that they present diverse views in relation to what they expect their students to master at the end of the school year. The schoolteachers seem to agree that: *"to read and to interpret different types of texts'* and *'to product texts'* are necessary. Regarding *'to product texts'* nevertheless the teachers differ amongst themselves when they try to specify the complexity level they consider in the assessments, for example the conjugation norms and to verbal concordance. One of the teachers specified that the lecture transcends the exclusively scholarly situations.

The contents to be taught in Mathematics are considered by third grade teachers with relative clarity. In some cases, nevertheless, the teachers did not mention what they specifically expect their students to learn. One teacher, for example, mentions the contents related to the four basic arithmetical operations. Two of them mention also its usage and application. Only one teacher specifies *"to solve problem-situations by using diverse operations, by selecting procedures"*. Some of the teachers seem to amplify the contents and abilities list to be considered in this grade. For instance adding: *"to measure, using unites that adjust themselves to different situations"*.

With respect to Science teachers point out more frequently the following contents: *"food and nutrition; personal and social hygiene; animals; plants; basic characteristics of air, water and soil"*. Some answers show greater preoccupation with issues related to life in society.

In History the third grade teachers emphasize student activities, which consider the lives of the students, their families and the city in which they live. Only two or them consider important that the students, at the end of the third grade, develop critical thinking. They do not specify, however, in what way the school activities would be developed and which indicators would be considered as pertinent to this ability.

Similarly to History, the focus considered in the subject matter Geography seems to be more related to the students' more immediate surroundings: the town where they live. More elaborated individual answers are found but they are not frequent: "*economical differentiation between rural and urban landscapes and their characteristics"*, for example.

For all the fourth grade teachers, *"to read and to interpret varied types of texts in order to inform, enjoy themselves and understand the thematic unity of the text"* and *"to product diverse types of texts that demonstrate cohesiveness, coherence, organization of dialogues, orthography, punctuation, vocabulary"* are knowledge (contents and abilities) that the student must master at the end of this grade. *'To orally express themselves within a social group, with clarity and efficacy"* constitutes other set of contents and abilities considered by 45% of these teachers. They also mention other contents and abilities to be considered, but with smaller frequency: *"to argue about and to discuss diverse texts"* (28,6%) and *"to use correctly the dictionary* (14,3%). They don't indicate, however, the levels of difficulty or complexity in which the knowledge may be dealt with in their classrooms.

T12: Conjugation, to me, is to be considered in the grammar and in the text...

T15: We do not work grammar separately from text. When a grammatical issue appears at the text we work it.

T12: In the text you can ask the student to localize, to identify [grammar aspects]. The text serves as subterfuge and resource.

R: Even when you don't deal with verb conjugation it's necessary to list what must be explored in the text.

T12: I think that there is prejudice regarding grammar. Things used to work this way: grammar was taught for grammar's sake alone. There was no application in the text. Then the situation shifted radically the opposite direction. We cannot now talk about verbs, give

labels grammatical terms. I think that this is not the best way... The middle ground seems to be more reasonable (...)

T12: Conjugation, to me, is to be considered in the grammar and in the text...

In Mathematics, the teachers emphasize the mastering of the four basic operations and their application in problem situations. Apparently, the most important knowledge in this particular grade is *"to solve fundamental operations with an understanding of the operational techniques, applying those operations in problem solving"* (85,7%) and *"to solve and understand the four basic operations employing natural numbers"* (71,4%). Consistent with the information gathered the Portuguese subject matter, the difficulty level and complexity of such knowledge was not indicated. Two teachers of this grade stressed the importance that such knowledge be related to everyday situations in the student's life.

This is different to what happens in other subject matter areas. In the Sciences a more considered valuing of the development of a broader knowledge set can be observed. All seven teachers in this group emphasized postures and attitudes related to aspects of life, and preservation of the environment: *"to know the environment, to protect it; to feel oneself with the land's ecosystems, being aware of its role in the transformations that occur"*. The teachers also indicate that 4th grade student's need *"to know and to take care of one's body"* (85,7%). Knowledge about diseases is also stressed (42,8%): *"to recognize STD's, hygiene, and health"*. Such indications are coherent when the age group of the students of these grades (10 to 14 years of age) is considered – the beginning of adolescence.

When it comes to History the teachers point to the diverse contents and abilities to be mastered by the students by the end of the 4th grade. The specifications made by them, especially in this case, were taken out of technical/pedagogical orientations made available by the school in workshops promoted by School Board related to History contents listed in the National Curricular Guidelines. The great majority of the indications (85,67%) involve, as a key knowledge *space-time' perception*, followed by the *knowledge of historical facts* (57,1%). Only 28,6% of the teachers, however, point out which historical facts are relevant and should be known by the end of the 4th grade.

In a similar way, the answers obtained regarding the subject matter Geography outline a set of abilities to be developed as time goes by. For this very specific teaching strategies are demanded, along with the construction of an appropriate classroom environment, as the interaction factor is constantly present – be it teacher-student or student-student. More specifically, teachers seem to emphasize a knowledge that is related to citizenship (85,7%), cultural and environmental diversity (42,9%), and environmental preservation (42,9%). To 60% of the teachers, it is vital that the students become aware of the close relations that bind History to Geography, and vice-versa – that the students understand the relations between space and time over mankind's evolution.

3.2. Analyzing some results

On broad strokes, a comparative analysis of the teachers' individual speech, by respective grade, makes evident certain points and raises some hypotheses:

1. The construction of poorly elaborated and enlightening answers of what exactly a student must know by the end of a given grade having consideration of his or her performance in the next grade may reflect lack of practice in specifying the curricular contents in a written formal way.
2. The knowledge (content and abilities) more frequently indicated seem, in most cases, not to discriminate between the different grades. Such knowledge might, in that way, be taken as pertinent to any of the four initial grades of elementary school teaching.
3. The reports offer some clues which indicate that, regardless of grade, the teachers' attribute more importance to content and ability related to the subject matters Portuguese and Mathematics. When one analyses the type (and frequency) of goals stressed by them when discussing both of these curricular components. To read, to write, to reckon and to solve simple mathematical problems, build a set of basic knowledge that should be

dominated, obligatorily, by the students by the end of the 4th grade of elementary school teaching.

4. For the teaching of the remaining components – taking into consideration the range in which the goals and contents were indicated, as well as the abilities related to them – a fertile school culture is needed. The observed school culture at first seems not to match everyday classroom practices.
5. It is possible the teachers, in what refers to knowledge related to the subject matter History, have gradually been presenting (from, 1st to 4th grade) much more of a declaration of aspirations than an appropriate knowledge set, connected to goals to be aimed for and achieved.
6. Regarding Portuguese and Mathematics, the answers represent much more micro-objectives than macro objectives (Giroux, 1997). However Geography, the Sciences, and History the answers refer much more to macro-objectives than micro-objectives.

The results of this **initial 'learning and teaching experience'** offer some understandings regarding the knowledge base construction processes of elementary schoolteachers. This study, particularly, enlightens 'what the teachers must know'. It was a first and necessary step in order to know 'how the teachers know what they know'.

1. The ***specific content knowledge*** of different subject matters seems to be, on the one hand, the nucleus and, on the other, a fragile focus of the specification of the knowledge base.

Consider Portuguese and Mathematics (key subject matters). The mentioned contents are general and permeate all grades. The teachers' work is centered in teaching to read, to write and to reckon, in this particular order, throughout the four grades. The ways they describe and explain the different subject matter seems to reflect what, in fact, occurs in the classrooms.

Answers relating to the Sciences, History and Geography are less precise with regard to what may occur in the classroom. They seem to constitute more a declared intention that travesties what they really don't perform. What the teachers specify the students must learn in these subject matters don't seem to translate to what, in reality, they actually accomplish in their classrooms. There are strong indicators that the mastering of specific content knowledge is poor in these subject matters. Equally, there are also strong indicators that although poor, this knowledge is considered sufficient.

Most of the teachers define the knowledge base in terms of what an external observer could understand as being minimum, taking into account the real objectives of the fundamental teaching. Apparently they consider this minimum as being the maximum within the conditions presented by the public school systems and by the specific school at which they teach; in reality, is a privileged school considering the social and economical characteristics of the students and the facilities.

Paradoxically, the teachers do not seem to associate what they teach with what their children's teachers teach in other schools (especially the private ones). They also do not realize that they give different emphasis to the different subject matters and communicate them to their students. What seems to be the most important is exactly what they teach badly. That is, they teach with low expectations. These low expectations refer not only to what they do in the classrooms but also to what they think their students may perform. The predictions, in this phase of schooling, seem to be taken for granted. We can say that, not being able to master the specific content knowledge sustains their low expectations regarding the students. This low expectation seems to reflect the low investment in the students' learning processes.

2. The construction of ***pedagogical content knowledge*** (Schulman, 1986, 1996) has been considered by the teachers as the most important element necessary for learning to teach. The poor mastering of the specific content knowledge, however, seems to influence the quality of the teachers professional learning processes when the construction of the pedagogical content knowledge is considered.

According to Perrenoud (2000), to translate the curriculum into learning objectives and these objectives into real situations is not a linear activity that considers each one of the objectives separately. The knowledge and high level of savoir-faire are construct in multiple and complex situations, each one of them related to different objectives or even different subject matter

contents. In order to organize and to conduct such learning situations, the teacher must know much more than their students. Such mastering implies teachers' fluency and flexibility in order to construct those contents in open situations and in complex tasks, considering the context, and the student interests, exploring the events and favoring an active knowledge appropriation and transfer.

The specific content knowledge related to Portuguese is considered the unquestionable domain of schoolteachers, even of those who present difficulties in mastering it. The way they teach, however, seems to be similar for both these categories, independent of grade, learning styles and students repertoires. Based in content transmission, it seems to be consensual that this situation couldn't be different.

According to Gimeno Sacristan (1995), the Language Curriculum implies objectives and specific contents - related to this subject matter area – aiming the development of expression and communication. It is doubtful, however, that in real uses such objectives and contents are fully reached – or even searched. In the school practice, the language curriculum seems to be other than the one established as official. The students may not always express themselves or communicate what they feel and what they really think. They may not always perform themselves in a similar way as they usually perform according to the teachers instructions and not according to what is more meaningful to them. The ordered tasks are not always attractive to the students. In those activities the oral language code of the students is abandoned. It is supposed that they must give answers to the teacher, taking into account both the implicit rules about what can or can't be said, and the teacher's allowed linguistic code.

The different valuing of the subject matters reflecting the commitment to mastering specific content knowledge and to the ways the schoolteachers could teach them can be considered in three remaining distinct sets. The first one includes Mathematics, the second Sciences and History/Geography. The third – seldom mentioned by the teachers – could be formed by other areas of the curriculum: Physical and Art Education. This last set doesn't constitute source of preoccupation to the teachers. The total non mastering of the specific content knowledge of these subject matters is dissimulated in the school culture when the teachers consider that they deal with this kind of knowledge when teaching other subject areas. This knowledge is included by them in the so-called 'transversal themes' and is not worked in the classroom.

When the teachers mention a list of contents, which can be considered more a declaration of intention than a day-to-day pedagogical practice, they are probably establishing a barrier to the construction of the pedagogical content knowledge. At first sight, such a list of contents may be interpreted as translating a broader vision of the educational process, of equity, and of social justice. A more focused analysis, however, indicates that the way these teachers act/work and the school culture do not translate the real meaning of what is verbalized. A traditional and vertical pedagogical practice is sustained, covered through a progressive speech.

3. The ***pedagogical knowledge***, the contents related to educational, developmental and learning theories are seldom verbalized. These contents seem to be mastered by all the teachers. They are, however, seldom triggered by the them in order to explain their pedagogical practices. Some theories/educational proposals are converted into sets of simple precepts: for each of the precept there are predicted/foreseen behaviors that are independent from any context. For instance: the result of an isolated psychological test can be understood to explain all kinds of difficulties presented by a student. Such a result is taken only as a measure and is assumed unquestionably, scientifically legitimizing the judgements and decisions, which are made.

The Constructivism – the theoretical foundation of the National Curricular Guidelines – is translated by a considerable number of teachers into a set or precepts related to instructional procedures. 'To construct the knowledge' is understood, to either offer conditions for the students' learning and development or to be understood to passively assist an abstract process of construction without any kind of intervention. For example, errors seldom are corrected: the teachers consider that with time the child will naturally overcome them. The conceptions related to school/teacher/student failure and success verbalized by the teachers indicate that they see themselves as being responsible for the success. But they do not believe they are a key element in overcoming the school/student failure. Many times, psychological explanations relieve teachers' of being responsible to their students.

The teachers seldom consider the students' learning styles and the heterogeneity of the classrooms. When they do, a professional dilemma arises in an accentuated way. One can observe a trend to benefit students who perform better. Some teachers struggle when they dedicate themselves to students who present learning difficulties. Such a struggle is made evident when these teachers feel themselves abandoning the students whom don't have learning difficulties.

The verbalized pedagogical knowledge is related much more to the school situation/context – and to the classroom particularly – than to other contexts or ends and goals of education, curriculum, families and community.

One can observe that many teachers have only a particular view of the teaching: the view of her classroom. An articulated vision of the four first grades of the fundamental teaching which enables / allows the professional actuation in each of these four grades is seldom found. To teach in a different grade, for example, has created in these teachers' professional dilemmas. In order to cope with these changes the teachers frequently turn to strategies, which are similar to those at the beginning of their professional career.

The process of group discussion, as well as the production of collective answers from grade, has made evident that:

1. The activities run were considered important exercises for the teachers, whether we consider the analyses they presented, or the emotional involvement displayed by most of them during the activities;

2. The procedures used were adequate for the identification and understanding of some elements involved in the teachers' processes of individual and collective thinking, and also for putting their ideas under their peers critical control;

3. The attempts to formally communicate what is expected of the students by the end of a given grade seem important not only to situate the teachers individually, but also each amongst their peers;

4. The access to different sets of information from diverse sources was made possible, and probably made easier the identification and delimitation of the most pertinent and coherently correspondent to classroom reality educational goals

5. The accomplishment of this particular teaching and learning experience established favorable conditions for the construction, and, in some cases, the sharing, of new conceptions about both students and teaching.

Two hypotheses – not necessarily excluding each other – can be formulated in relation to the knowledge involved in the different subject matters, starting from the nature of the answers presented by the teachers during the development of all learning and teaching experiences.

The first hypothesis is related to the fact that in Portuguese and Mathematics the answers presented seem to be more specific and circumscribed, supposedly, to events and activities that are exclusive to the classroom realm.

They do not stress, for example, connections between "*methods, contents, and the structure of a course and its importance to the broader social reality*" Giroux, 1997, p. 88), even though the goals indicated by the teachers are undoubtedly relevant when this stage of schooling is considered. *To read, to write, and to reckon* composes a set of contents and abilities that is essential to posterior schooling, although it is also difficult to understand the lack of specificity of its level of occurrence along the four grades. The considerations made by the teachers relating Portuguese and Mathematics seem to be somewhat more concrete and grounded on facts more than those relating to the remaining curricular components. More possibly, part of the activities developed in the classroom is more frequently related to such components.

It is possible, then, that the teachers' answers correspond with greater precision to what they effectively develop in their classrooms, and to the knowledge they effectively have pedagogically mastered (or believe to have mastered), with little or no difficulty. In History, Geography, and the

Sciences, for example, social relevance of the stressed contents aside, a good part of the objectives indicated seem to be harder to achieve, when one considers their complexity, range, and the fact that pertinent teaching strategies are required.

If they occurred with frequency in the daily classroom life, it would be consistently expected that they would also appear on the answers offered to Portuguese and Mathematics. It is possible that, because the knowledge related to Sciences, History, and Geography is less worked, valued, and mastered by the teachers, the teachers do not feel comfortable in indicating, detailing, and exploring them. This supposition is grounded on the fact that the teachers, after accomplishing the proposed task, have searched for external reference such as students' books, journals, technical orientations of the school district, pedagogical orientation of the school coordinator etc., to elaborate their answers. The presented reports, considering the context in which they were produced, apparently possess a superior degree of complexity, involve more detailed actions, and with greater social value. However, it is important to remember that even in Portuguese difficulties related to certain contents were observed (for example: the meaning of cohesion, textual coherence, and its exemplification considering specific texts).

The second hypothesis raised related to the nature of the task proposed by the teachers themselves, which implied in 'translating', in oral and written form, "things that occur in the practice". In other words, translating the everyday actions – many times unconnected and with no apparent logic – into 'consistent and coherent theories or explanations'. Without a doubt, that difficulty, in a certain way, can be related, again, to the mastering or non-mastering of the contents and abilities by the teachers themselves. It can, also, be related to some aspects involved in the realization of the collective tasks.

It seems to be "easier" to speak and to write about what characterizes everyday experience than about general educational theories. How do we explain the moments of silence of some teachers during a few discussions related to the components of History, Sciences, and Geography? Why, in elaborating answers to questions related to such subject matters, have they searched for more complexly phrased answers? Does that imply the presence *cover stories* (Clandinin & Connelly, 1996) in their answers? Do the teachers wish to, individually or collectively, cause a "good impression", considering their lack of mastering of such contents? Have the teachers, for that matter, sought external "aid". Or have the teachers collaboratively presented answers and representations of what they would like to do, other than what they actually do in their classrooms? Are the answers sought of difficult formal specification? Have the teachers searched for a more elaborate formalization, and in that way been more aware of what effectively happens or not behind the curtains, so to speak, of a classroom, in the forms indicated by Goffman (1985)?

Such considerations are grounded in the professional knowledge placed in the interface of theory and practice in the lives of the teachers In other words, professional knowledge and its epistemological dilemmas, understood in terms of *secret, sacred and cover stories*, carrying the weight of the institutional cultures in which they manifest and make known themselves (Clandinin & Connelly, 1996).

4. **Final Considerations:** professional development process(es)

A comparison of the results of this learning and teaching experience and those of the other experiences show a set of trends which make possible some other understandings, mainly when we consider the teaching knowledge base construction process, that is, 'how schoolteachers have been learning to teach.

The schoolteachers' thinking expressed through oral and written reports refers, in general, more to events than to conceptual explications. By this stage of the project it was observed that part of the teachers shifted their focus from one to the other.

The intensity of the degree of participation and involvement of the schoolteachers increases when the discussion is related to their daily practices and to problems, dilemmas, and challenges they face in their classrooms.

The obtained results encourage the building of new learning and teaching experiences involving challenging and/or unbalanced situations related to the classroom context and aimed to the teachers' professional development (Schoenfeld, 1995).

Difficulties in verbalization of theoretical issues are frequently observed. The impression remains that the teachers consider their practice as their only realm of competence. Theoretical knowledge, by their understanding, resides solely on the researcher's domain. Part of the schoolteachers is only now beginning to act and see themselves as researchers of their own practice.

The verbalized conceptions/knowledge presented by the schoolteachers can be analyzed with the use of reflexive teaching literature. Different levels and kinds of knowledge and reflection are observed. It seems that reflection as conceptual orientation (Valli, 1992) can be applied.

Professional development processes of the schoolteachers are not linear or homogeneous. Idiosyncrasies and peculiarities are observed in each of them, which makes arduous the process of generalization in this stage of research. In this sense we think it would be more appropriate to talk about 'professional development processes'.

The teaching and learning experiences have demonstrated to be invaluable tools for the enhancement of professional development, especially those involving closer relation to the subject matters and to in-context learning experiences.

The verbalized teachers' knowledge seems to be attached much more to a roll of contents than to processes of construction of such knowledge. The list of contents is, otherwise, related to knowledge that can directly be applied in specific classroom situations. The contents, which are not at first sight perceived by the teachers as applicable, are not considered by them. Possibly such ideas explains their constant claims: "how to teach when..."

Finally, it's important to mention that when we deal with data which can be considered to be predominantly declarative knowledge, we must consider some specificity and some constraints as indicated by Feiman-Nemser & Remillard , 1995.

> *Declarative knowledge can never be a complete guide to practice. For one thing, teaching depends on judgement and reasoning which must also be learned. Moreover, much of what teachers need to know to respond to immediate classroom situations must be discovered by them over time in their particular context (Richardson 1994). If expertise in teaching consists of knowledge and commitments tied to actions, them we must consider not only what teachers know (or need to learn), but how they transform their knowledge into professional activity (Kennedy, 1987)* (p.15).

> *Until now we have separated the 'what' from 'how' of learning to teach in order to focus on the question of what teachers need to learn. Ultimately, content and processes of learning to teach must be brought together since how teachers learn shapes what they learn and are often part of what they need to know. Unfortunately, we know even less about the processes of learning to teach than we do about the content* (p.20).

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References

Brasil. Ministério da Educação e Cultura. (1997) *Parâmetros Curriculares Nacionais. 1ª a 4ª série. Introdução aos parâmetros curriculares nacionais.* MEC/SEF, Brasília –DF.

Calderhead, J. (1993) Dilemmas in developing reflective teaching. *Teacher Education Quarterly*, 20 (1), 93-100.

Calderhead, J.(1996). Teachers: beliefs and knowledge structures and comprehension processes. In J. Calderhead & R.C.Calfee (Eds), *Exploring teachers' thinking.* New York: Macmillan, 709-725.

Clandinin, D. J. (1986). *Classroom practice: teacher images in action.* Philadelphia: Falmer Press.

Clandinin, D. J.; Connelly, F. M. (1996). Teacher's Professional Knowledge Landscapes: Teacher-Stories - Stories of Teachers - School Stories - Stories of Schools. *Educational Researcher,* 25 (3), 24 - 30.

Clark, C. M.; Peterson, P. L.(1986). Teachers' thought processes. In M. C. Wittrock (Ed.), *The Handbook of Research on Teaching.* New York: Macmillan, 255-296.

Cole, A; Knowles, G. (1993). Teacher development in partnership research: a focus on methods and issues. *American Educational Research Journal,* 30 (3), 1993, 473-495.

Connelly, F.M., Clandinin, D.J. (1988). *Teachers as curriculum planners*: narratives of experience. New York: Teachers College Columbia University.

Darling-Hammond, L. (ed.). (1994). *Review of Research in Education,* AERA Washington, V.20.

Doyle, W. (1990). Case methods in the education of teachers. *Teacher Education Quarterly* 17 (1), 7-16.

Elbaz, F. (1983). *Teacher thinking: a study of practical knowledge.* London: Croom Helm,

Feiman-Nemser, S. & Remillard, J. (1995). *Perspectives on learning to teach.* http://ncrtl.msu.edu/http/ipapers/html/pdf/ip.953pdf

Fenstermacher, G.D. (1994). The knower and the known: the nature of knowledge in research on teaching. *Review of Research in Education.* 20, 3-56.

Gimeno Sacristan, J. (1991). Consciência e ação sobre a prática como libertação profissional dos professores. In A. Nóvoa (Org.), Profissão Professor. Porto: Porto Editora,

Gimeno Sacristán, J. (1995). Currículo e Diversidade Cultural. In: T.T. da Silva e A.F. Moreira (Ogs.) - *Territórios contestados: o currículo e os novos mapas políticos e culturais* - Petrópolis, RJ:Vozes.

Giroux, H. A. (1997). *Os professores como intelectuais.* Porto Alegre: Artes Médicas,

Goffman, E. (1985). *A representação do eu na vida cotidiana.* Petrópolis, Vozes, 1985.

Grimmett, P. P.; Erickson, G. L. (Eds.). (1988). *Reflections in teacher education.* New York, Teachers College Press..

Huberman, H. (1993) *The live of teachers.* London, Cassell and New York,:Teachers' College Press.

Knowles, G., Cole, A. & Presswood, C. S. (1994). *Through preservice teachers' eyes. Exploring field experiences through narrative & inquiry.* New York: MacMillan.

Marcelo, C. (1998). Pesquisa sobre a formação de professores. In *Revista Brasileira de Educação,* 9, 51-75

Mizukami, M.G.N., Reali, A.M.M.R., Reyes, C.R., Martucci, E.M., Lima, E.F., Abib, M. L. V.S., Tancredi, R.M.S.P.& Mello, R.R. (1998). *A reflexão sobre a ação pedagógica como estratégia de modificação da escola pública elementar numa perspectiva de formação continuada no local de trabalho.* Relatório de Pesquisa 2, FAPESP, 1998.

Nóvoa, A.(Org). (1992). *Os professores e a sua formação*. Lisboa: Dom Quixote.

Perrenoud, PH. (2000). *Dez novas competências para ensinar. Convite à viagem*. Porto Alegre, Artes Médicas Sul.

Valli, L. (1992). *Reflective Teacher Education; cases and critiques*. New York: State University of New York Press.

Schoenfeld, A H.(1997) *Toward a theory of teaching-in-context*. http://www.gse.berkeley.edu/Faculty/aschoenfeld/TeachInContext/teaching-in-context.html.

Schön, D. Coaching reflective teaching. In P.P. Grimmett &G.L. Erickson (Eds.). (1988). *Reflections in teacher education*. New York: Teachers College Press, 19-29.

Schön, D. (1987). *Educating the reflective practioner*. San Francisco: Jossey Bass.

Schön, D. (1983) *The reflective practioner*. New York: Basic Books.

Shulman, L. (1992) Toward a pedagogy of cases. In J. Shulman, J. (Ed.) *Case methods in teacher education*. New York: Teachers College Press, 1-30.

Shulman, J.H. (1992). *Case methods in teacher education*. New York: Teachers College Press.

Shulman, L.S. (1987). Knowledge and teaching: foundations of the new reform. *Havard Educational Review*, 57 (1), 1-22.

Shulman, L.S. (1986). Those who understands: knowledge growth in teaching. *Educational Researcher*, 15 (2), 4-14.

Shulman, L. Just in case: reflections on learning from experience. In J. Colbert, K. Trimble, and P. Desberg, P. (Eds.) (1996). *The case for education: contemporary approaches for using case methods*. Needham Heights, Massachusetts: Allyn & Bacon, 197-217

Tardif, M., Lessard, C. & Lahaye, L. (1991). Os professores face ao saber. Esboço de uma problemática do saber docente. *Teoria e Educação*, 4, 1991.

Torres, R.M.(1998). Tendências da Formação Docente nos Anos 90. In M.J.Warde (Org.) *Novas Políticas Educacionais: Críticas e Perspectivas*. II Seminário Internacional. PUC-SP, 173-191.

Torres, R. M. (1999). Nuevo rol docente: qué modelo de formación, para qué modelo educativo? In Fundación Santillana. *Aprender para el futuro. Nuevo marco de la tarea docente*. Documentos en Debate. Madrid, 99-112.

Wilson,S., Shulman,L.S. & Richert ,A.E. (1987). 150 ways of knowing: representations of knowledge in teaching. In J. Calderhead (Ed.), *Exploring teachers' thinking*. Great Britain: Cassell Educational Limited, 104-124.

Wittrock, M. C. (Ed). (1986). *The Handbook of Research on Teaching*. New York, Macmillan,

Zeichner, K. (1993). *A formação reflexiva de professores: idéias e práticas*. Lisboa: Educa, 1993.

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